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RYU.026

**REMARKS**

Claims 1-20 are all of the claims presently pending in the application and claims 2, 6, 8, 9 and 11 are withdrawn from consideration. Applicants have amended claims 1-6 and 8-10 to more particularly define the claimed invention.

The amended and new claims are supported by the original claims, specification and drawings in their entirety.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1, 3-5, 7, 10 and 12-20 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Yamamura et al., (U.S. Patent No. 6,742,363) in view of Lipowski (U.S. Patent No. 4,650,380), Doudet (U.S. Patent No. 4,386,513), and Japanese Patent Publication No. 57-121810.

This rejection is respectfully traversed in the following discussion.

**I. THE CLAIMED INVENTION**

The claimed invention (e.g., as defined by exemplary claim 1) is directed to a method of elongating optical fiber base material, including heating and softening base material ingot in such as an electric furnace, drawing said ingot with a pair of pinch rollers; and elongating the ingot to make base material rod having a smaller diameter than said ingot, wherein either one of a roller groove having a curvature radius which is greater than the outer diameter of the

base material rod and a V-shaped roller groove having the cross section including straight lines is formed on each surface of the pinch rollers made of metal, and wherein the facing roller grooves respectively formed on the surfaces of a pair of the pinch rollers nip and draw the base material rod. Moreover, a position of the pinch rollers is adjusted such that a straight line, connecting a central axis of the heating means with a groove center of the roller grooves respectively formed on surfaces of the pair of pinch rollers, is parallel to a traveling direction of the base material ingot fed into the heating means.

In the conventional art, during the elongation, the base material rod having a small diameter is nipped by a pair of pinch rollers and drawn. The surfaces of the used pinch rollers were burnt and damaged by contacting with the base material rod having a high temperature of over 400 degree centigrade, which causes the rollers to change size and shape with time. The pinch rollers, therefore, cannot draw the rod at the proper position, which makes the base material rod curved. (Application, paragraph 5).

The claimed invention of exemplary claim 1, on the other hand, provides the method of elongating optical fiber base material without being curved and correcting the curvature, and with high productivity, and the apparatus for elongating the same. (Application, paragraph 9). In addition, the claimed invention includes where a position of the pinch rollers is adjusted such that a straight line, connecting a central axis of the heating means with a groove center of the roller grooves respectively formed on surfaces of the pair of pinch rollers, is parallel to a traveling direction of the base material ingot fed into the heating means.

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## II. THE ALLEGED PRIOR ART REFERENCES

**The Combination of Cited References of Yamamura et al., (U.S. Patent No. 6,742,363), Lipowski ( U.S. Patent No. 4,650,380), Doudet (U.S. Patent No. 4,386,513), and Japanese Patent Publication No. 57-121810**

The Examiner has alleged that Claims 1, 3-5, 7, 10 and 12-20 are obvious under 35 U.S.C. § 103(a), because of the combination of Yamamura et al., (U.S. Patent No. 6,742,363) in view of Lipowski ( U.S. Patent No. 4,650,380), Doudet (U.S. Patent No. 4,386,513), and Japanese Patent Publication No. 57-121810.

The claimed invention (e.g., claim 1) includes a *method of elongating optical fiber base material comprising:*

*heating and softening a base material ingot in a heating means;*

*drawing said ingot with a pair of pinch rollers; and*

*elongating the ingot to make base material rod including a smaller diameter than said ingot,*

*wherein a roller groove of said pinch rollers includes one of a curvature radius which is greater than the outer diameter of said base material rod and a V-shaped roller groove with a cross section including straight lines formed on each surface of said pinch rollers comprised of metal,*

*wherein the facing roller grooves respectively formed on the surfaces of a pair of said pinch rollers nip and draw said base material rod, and*

*wherein a position of the pinch rollers is adjusted such that a straight line, connecting a*

central axis of the heating means with a groove center of the roller grooves respectively formed on surfaces of the pair of pinch rollers, is parallel to a traveling direction of the base material ingot fed into the heating means.

In the claimed invention, the position of the pinch rollers is adjusted so that the straight line connecting the central axis of the heating means with the groove center of the roller grooves respectively formed on the surfaces of the pair of pinch rollers is parallel to the traveling direction of the base material ingot fed into the heating means.

For example, such a configuration can prevent the heated and softened part, in which the base material ingot shrinks the diameter to transform into the base material rod, from getting bending moment from the pinch rollers, which can make the elongated base material rod less curved.

On the other hand, none of the cited references teaches or suggests adjusting the position of the pinch roller as claimed as shown below.

Yamamura teaches that a method for manufacturing a glass rod (106), which is a parent material of an optical fiber (350), including adjusting a vertical inclination of a standard rod (138) having a predetermined straightness; and heating and elongating a base material (102), which is a parent material of the glass rod (106), along an axis of the standard rod (138), the vertical inclination of which is adjusted, to generate the glass rod (106). (Abstract of Yamamura).

Yamamura mentions that "FIG. 10 and FIG. 11 show examples that use elongating rollers 144a and 144b on the elongating mechanism 140 instead of the elongating chuck 142. To adjust the vertical inclination of the axis connecting the hanging mechanism 134 and the elongating mechanism 140 in the case of using the elongating rollers 144a and 144b, the

following method is adopted. The standard rod 138 is held by the elongating rollers 144a and 144b as opposed to the holding of the standard rod 138 by the elongating chuck 142 (FIG. 7, S116)." Col. 8, lines 23-31.

Yamamura includes only a vertical inclination being adjusted, but as shown above, Yamamura fails to teach or suggest a position of the pinch rollers is adjusted such that a straight line, connecting a central axis of the heating means with a groove center of the roller grooves respectively formed on surfaces of the pair of pinch rollers, is parallel to a traveling direction of the base material ingot fed into the heating means.

The reference of JP 57-121810 also fails to teach or suggest the claimed invention. The Examiner on page 5-6 of the office action alleges that Japanese Patent Publication 57-121810, according to the abstract, teaches "wherein a positioning adjustment apparatus supporting said pinch rollers adjusts the position of the apparatus using one of a vertical line of laser beam and a plumb bob, which is parallel to the traveling direction of the base material ingot, runs through the middle of the heating means and the center point of the shorter rod, to determine the positions of said pinch rollers (abstract, constitution)."

However, JP 57-121810 includes the following in its constitution, "laser irradiating part 41 is mounted to the guide 4 on the inlet side of the 1st stand S1 of multistage rolling mills for steel pipes, and a detector 51 for a laser beam is mounted to the guide 5 on the exit side of the final stand S8. A beam is emitted from the part 41, and the center of the detector 51 is aligned to the center 0-0 of the beam and this is used as a reference line for the centers of rolling rolls. Next, housings 1-1g are installed to stands S1-S8 and the deviations of the centers of the jigs mounted to the respective housings from the beam center are detected with the detector 51. In accordance with the results of this detection, the centers of the respective rolling rolls are

corrected, thence the jigs are removed, the housings are again installed to the stands and the centers of the rolling rolls of the stands S1-S8 are aligned to the reference line 0-0."

However, clearly JP 57-121810 fails to teach or suggest a position of the pinch rollers is adjusted such that a straight line, connecting a central axis of the heating means with a groove center of the roller grooves respectively formed on surfaces of the pair of pinch rollers, is parallel to a traveling direction of the base material ingot fed into the heating means. JP57-121810 does not even teach of adjusting the position of the pinch rollers where the straight lines connecting the heating means with the groove center are in a direction parallel to the traveling direction.

Moreover, Lipowski and Doudet also fail to teach or suggest the claimed invention.

Therefore, it is clear that the combination of the cited references fail to teach or suggest the claimed invention. Therefore, Applicants respectfully request the Examiner to withdraw this rejection.

### **III. FORMAL MATTERS AND CONCLUSION**

In view of the foregoing, Applicants submit that claims 1-20, all of the claims presently pending in the application, are patentably distinct over the alleged prior art of record and are in condition for allowance. Applicants respectfully request the Examiner to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, Applicants requests the Examiner to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

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The undersigned authorizes the Commissioner to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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